

United States Patent [19]

Sainton

[11] Patent Number: 5,761,621

[45] Date of Patent: Jun. 2, 1998

[54] APPARATUS AND METHODS FOR NETWORKING OMNI-MODAL RADIO DEVICES

[75] Inventor: Joseph B. Sainton, Allen, Tex.
CHARLES M. LEEDOM, JR., FALLS CHURCH;
ERIC J. ROBINSON, ASHBURN, BOTH OF VA
[73] Assignee: Spectrum Information Technologies,
Inc., Purchase, N.Y.

[21] Appl. No.: 709,112

[22] Filed: Sep. 6, 1996

Related U.S. Application Data

[63] Continuation of Ser. No. 167,002, Dec. 15, 1993, abandoned.

[51] Int. Cl.⁶ H04Q 7/22

[52] U.S. Cl. 455/453; 455/454; 455/552

[58] Field of Search 455/438, 453,
455/454, 517, 524, 552; 379/59, 60

References Cited

U.S. PATENT DOCUMENTS

4,144,496 3/1979 Cunningham et al. 455/54.1
4,371,751 2/1983 Hilligoss, Jr. et al. .
4,558,453 12/1985 Mimken .
4,578,796 3/1986 Charalambous et al. .
4,741,049 4/1988 De Jager et al. .
4,811,420 3/1989 Avis et al. .
4,833,727 5/1989 Calvet et al. .
4,985,904 1/1991 Ogawara .
5,020,094 5/1991 Rash et al. .
5,077,834 12/1991 Andros et al. .
5,122,795 6/1992 Cubley et al. .
5,127,042 6/1992 Gillig et al. 455/33.1 X
5,134,709 7/1992 Bi et al. 455/34.1 X
5,179,360 1/1993 Suzuki 455/86 X
5,200,991 4/1993 Motoyanagi .
5,201,067 4/1993 Grube et al. .
5,239,701 8/1993 Ishii .

5,249,302 9/1993 Metroka et al. .
5,261,117 11/1993 Olson 455/54.2 X
5,293,638 3/1994 Sasuta et al. 455/34.1 X
5,343,513 8/1994 Kay et al. 455/34.1 X
5,649,308 7/1997 Andrews 455/84

OTHER PUBLICATIONS

*"Electronic Messaging System (EPS)", Feb. 5, 1993. Complex Architectures, Inc.
"Motorola Paging & Wireless Data Group", Bob Growney and William Davies, pp. 155 and 156. Portable Computers Wireless Communications, 1993.
"Racotek", Richard Cortese and Larry Sanders, pp. 176-178. Portable Computers and Wireless Communications, 1993.

Primary Examiner—Edward F. Urban
Attorney, Agent, or Firm—Sixbey, Friedman, Leedom & Ferguson; Charles M. Leedom, Jr.; Evan R. Smith

[57] — SA ABSTRACT

A network and method of operating a network of wireless service providers adapted to interact with a plurality of omni-modal wireless products within a given geographic area in a manner to permit the wireless service providers to "borrow" radio frequencies from other wireless service providers within the same geographic region. As a cellular service provider in a given region finds that one of its service areas or cells has become nearly or fully loaded, frequency could be borrowed from a competitor, such as a PCS provider serving the same region. Selected omni-modal wireless product users in the overloaded area would be told to switch their omni-modal to the "leased" frequency but to use the non-PCS communications protocol appropriate to the type of service desired by the user. Implementation of this method broadly within a given geographic region will have the effect of insuring that the available radio spectrum is used to its maximum capacity to serve the needs of the wireless users on a real time basis. EA

24 Claims, 16 Drawing Sheets

